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# REGULATING OFFGRID ELECTRIFICATION

# Consultant Terms of Reference

## BACKGROUND

### Project Background

*<Rationale for the project, project history>*

### PV for Off-grid Electrification

Although a few other stand-alone renewable energy technologies (RETs) could be used where they are found to be the most appropriate, the majority of off-grid electrification under [project name] will be through the use of photovoltaics (PV). Commercial dissemination of PV worldwide has been done via two main mechanisms implemented by private companies: a) open market sales or "dealer model" and b) competitively-bid market package model.

#### Open Market Sales

*<Background on use of open market sales in the country and potential under the project>*

#### Competitively Bid Market Packages

*<Background on use of open market sales in the country and potential under the project>*

A “market package” is defined here as consisting of a group of potential users clustered in a contiguous area, including households and public facilities (a bundled economic package). The winning private company is awarded Government subsidy support and monopoly rights to the area, in return for a commitment to provide service and/or deliver certain installation targets for a certain period. MPs are identified and prepared by the Government.

In general, there are two main variations of the competitively-bid MP approach:

1) Concession model (also known as *fee-for-service* or ESCO model). The winning bidder provides *electricity service* to users in the area. It installs PV systems and provides continuous O&M service for the duration of a formal concession period, e.g., 15-20 years. Users pay a monthly tariff but do not own any system. Examples are projects in Argentina, Morocco, etc.

2) Non-concession model (also known as the *Sustainable Solar Market Package* (SSMP) model in the Philippines and the Medium Term Service Contract (MSC) model in Bolivia). The winning bidder installs PV systems in selected public facilities (a guaranteed base load business for the company, paid for by the Government) and sells SHS to households in the subject area, per individual demand, without competition over a set period (e.g., 3 years). Users own the systems. Mandatory maintenance services are provided over a 2-4 year period. The total period of engagement of the company in the monopoly area, from installation of systems to the maintenance services period is only about 5-7 years. The differences between the Philippines model and the Bolivia model, as well as with other variations practiced elsewhere) are mainly in the, the manner by which total subsidies are determined; how payments to the company are rationed in accordance with the achievement of certain outputs; the length of required service-after-sales period; and other obligations that may be imposed on the winning company as regards development of the area.

Identifying a specific PV market package mechanism that is most suited to the conditions in [Country] is the subject of a separate consultant study. Whether the mechanism finally chosen for [Country] is the concession system or the shorter-term no-concession model or a blend of features of the two, the monopoly nature of the MP model will need new regulatory systems that clearly define the rules for the competitive bidding and the subsequent implementation phase.

### Isolated non PV RET Minigrids and Microgrids

Aside from individual PV systems, [project name] will also make an effort to identify potential investments in small power systems using other renewable energy technologies (RET), where feasible, such as micro-hydro or small wind turbines, to supply electricity to users connected to an isolated grid. This is a subject on which [project name] will provide support during the implementation stage.

Based on experience elsewhere, these types of small, isolated projects are often best operated and maintained by community-based organizations, where the managers are also the consumers. For small, one-off, remote area projects (e.g. less than 300 kW) the cost or necessity of formal regulation by an external entity is not considered justified; “self-regulation” may be the best approach.

Depending on the scale, location and financing of the specific project (e.g., a large program consisting of many small isolated systems), it may be possible to attract an external private company to manage the operation and maintenance of the RET plant for extended period. In that case, it may be necessary to establish some form of regulation that protects consumers from excessive tariffs or poor quality of service by the for-profit private provider.

## OBJECTIVE OF THE CONSULTING ASSIGNMENT

Develop simple, light-handed and cost-effective regulations applicable to private sector implementation of Government funded decentralized, off-grid electrification projects, under the proposed [project name].

## CONSULTANT TASKS

### Task 1: Review

a) The results and recommendations of a separate consultant study to identify suitable mechanisms for implementation of a significantly scaled-up program for dissemination of PV and other RETs in [Country];

b) The existing regulatory framework for the power sector that is relevant for rural electrification, as reflected in [relevant legislation]

c) The regulatory systems and rules set up in projects with competitively bid market packages for PV and other RETs in [Country] and other countries ([Country names]).

d) The rules and forms of regulations, if any, set up in projects with open-market commercial dissemination of PV and other RETs in [Country] and other countries, including [Country names] and other examples deemed relevant by the consultant.

5) The experience with community-managed RET systems in various countries: how they are operated, maintained and regulated.

### Task 2: Carry out tasks

Based on the results of the above reviews and the consultant's own expertise in this field, carry out the following tasks:

#### 2.1. Community-based RET Systems

1. Determine under what conditions (project scale, location, financing, etc.) community-based RET systems, where the managers are also the plant owners and consumers, should be subject to regulations by the Government.
2. Specify the exact type of regulations (guidelines, norms, best practices and/or standards) such systems should be required to comply with, considering the need to help rather than hinder the communities, and to minimize the costs of enforcing regulation. Based on the consultant’s analysis, recommend key considerations that these regulation instruments should cover.
3. Determine under what conditions the community-based RET systems should be allowed to self-regulate.

#### 2.2. Assessing the Need for Regulation

1. Assess whether current procedures (*de facto* regulation) for private participation in the open-market sales program for PV is adequate for the proposed nationwide expansion under [project name], both for PV and other RETs (e.g. pico-hydro). If considered inadequate, recommend revisions to the existing guidelines or propose more formal regulatory procedures.

#### 2.3. Regulating the Bidding process

1. Prepare clear procedures for implementation of the bidding process for PV and RET market packages, covering, as relevant, the phases of: eligibility screening of prospective bidders, evaluation of bids, post-qualification, and award of contract. Given the typically small scale of the packages, strive to simplify the procedures, eliminate marginally needed steps and reduce the cost of the bidding process to both the Government and private bidders.
2. Outline a timeframe for each step and for the whole process.
3. Determine what preferential treatment, if any, should be extended to companies already accredited and actively participating in the open market program. Assess, for example, whether the accreditation process they have already passed should exempt them from the eligibility screening of prospective bidders for the packages.
4. Define minimum eligibility requirements for prospective private bidders. Specify type of experience relevant to the project, financial capacity and expertise of key personnel. Examine whether NGOs should be considered.
5. Determine under what conditions (e.g., type of technology, need to install numerous similar systems, etc.) a certification process, such as the one currently used for solar PV dissemination, would be warranted. Note that a certification process implies requiring compliance with minimum technical, financial and other requirements.
6. Recommend appropriate criteria for selection of the winning bid. Evaluate suitability to [Country] of criteria that have been used in other [Donor] projects, including: a) lowest subsidy per connection; b) most number of connections within a fixed budget, and c) a combination of both.
7. Determine under what conditions, if any, the Government should consider direct negotiations with a service provider for a specific package instead of bidding it out. Examine legal and other constraints that may be imposed by established procurement policies and procedures.

#### 2.4. Regulating the Fee for Service Concession (for PV and non-PV RETs)

If the concession model is appropriate for [Country] based on the recommendations of the study on business models (a parallel study), the consultant is expected to carry out the following:

1. Assess whether the current legal and regulatory framework in [Country] is adequate to allow small concessionaires for rural electrification, and how small concessionaires would access [power utility] energy infrastructure, if needed. If not, recommend changes needed to enable this approach and analyze the level of efforts to make these changes.
2. Recommend a detailed methodology for designing a cost recovery-based tariff structure for concession projects in [project name], taking into account the need to ensure commercial viability of the service provider while meeting the generally low ability to pay of the concession customers. This implies the need to carefully balance tariff structure with the available total subsidy for the project. Among others:
   1. Examine the need in tariff setting for customer segmentation vs. setting a uniform tariff structure.
   2. Suggest how to establish a monthly tariff, consisting of a fixed charge that covers basic service to low income customers and a variable component that properly charges for higher levels of consumption.
   3. Suggest how best to determine and set up a payment scheme, as needed, for the connection fee, which is often a bigger financial barrier for customers than the monthly tariff.
3. Define a minimum standard quality of service for concessionaires, including the prompt carrying out of needed maintenance and repairs to ensure continuity of electricity service to customers. The standard must include the commercial aspects of billing, collection and claims handling. Suggest how and when audits should be carried out to monitor service performance, and recommend an appropriate schedule of penalty for non-compliance.
4. Examine the available options (handover to another concessionaire, renew contract, etc.) and recommend an appropriate exit strategy to be specified in the concession contract. Include the special case when the grid "arrives" in the area and it becomes more economical to simply connect the customers to the main grid.

#### 2.5. Regulating the Non-Concession Market Package Mechanism

1. Assess whether putting a price cap on PV equipment, as practiced in the Bolivia project, for example, is a potentially effective way to protect customers in this mechanism from excessive cost. Discuss the pros and cons of this type of regulation and recommend whether it should be adopted in [Country].
2. Recommend minimum technical requirements for PV equipment and installation.
3. Define a minimum standard quality of service for the after-sales maintenance period, including the prompt carrying out of needed maintenance and repairs to ensure continuity of electricity service to customers. Suggest how and when audits should be conducted to monitor service performance, and recommend an appropriate schedule of penalty for non-compliance.

#### 2.6. Institutional Arrangements

1. Given the regulatory system and institutional structure already in place for rural electrification in [Country], recommend the simplest way to add independent regulation of the decentralized, off-grid electrification projects in [project] at implementation, particularly those that will be subject to competitive bidding.
2. Assess the institutional capacity for policy-making and regulations related to off-grid electrification and identify the needs, if any, for strengthening the capacity of related institutions (e.g. [institution names]).

## ESTIMATED LEVEL OF EFFORTS AND DELIVERABLES

1. The estimated level of effort for this assignment is approximately 25 man/days of professional staff time.
2. A country visit is recommended, at which time discussions are held with [name of agencies] and other relevant agencies, interviews are made with local PV companies and MFIs, and familiarization visits are made to selected rural sites - including communities where electricity is supplied from minigrids or microgrids -, etc. At this time, details of the consultant tasks may be revised to reflect the results of the discussions, while maintaining the scope and key objectives of the study. After the country visit, an inception report will be prepared and submitted to the [donor] containing a detailed description of how the tasks outlined in this TOR will be carried out by the consultant, as well as suggested revisions, if any.

In addition to the inception report, the Consultant is expected to deliver a draft final report that is subject to comments by the [Government of Country] and the [Donor], and a final report. The final report should summarize the results of each task outlined above and then recommend a simple, light-handed and cost-effective regulatory mechanism suitable to the conditions in [Country], applicable to private sector implementation of Government funded decentralized, off-grid electrification projects, using PV and other RETs.

## CONSULTANT’S QUALIFICATION REQUIREMENTS

* Masters or PhD degree in the field of science, engineering, economics, finance or a related subject.
* A minimum of 15 years of relevant professional experience and at least 10 years of experience in energy sector policy and regulation.
* Demonstrated knowledge and experience in policy and regulations related to off-grid rural electrification in [Region].
* Demonstrated knowledge about the energy sector structure and related policy and regulations in [Country].
* Knowledge about experience and lessons learned for off-grid electrification policy and regulations in other countries than [Region].
* Fluency in [language 1] and [language 2] and excellent oral communication and writing skills in both languages.